**PSG COLLEGE OF TECHNOLOGY, COIMBATORE – 641004**

**DEPARTMENT OF INFORMATION TECHNOLOGY**

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**PYTHON PROGRAMMING LABORATORY – CA2**

**SET - 1**

Create a classes NLP and StringProcess. The NLP class consists of the following member functions:

**count** – to find the number of characters of the given word.

**Tokenizer** – to split the given string into words

The StringProcessing class consists of the following functions:

**isPalindrome** – to check whether the given word is a palindrome.

**toLowerCase** - converts the given string into lower case letter

**stopWordRemoval** – this function checks for the strop words and remove it. Check for the following stop words: [is,of,are,was, were, the]

The StringProcessing function inherits the class NLP. The application should receive a sentence [in upper case letter] from the user as input, convert that into lowercase, remove the stop word, tokenizes the sentence into words and display the words that are palindrome. It should also display the number of characters in the palindrome.

**SET - 2:**

Define a class “DigitExtraction” consisting of functions “extractFirst” and extractLast to extract the first and last digit of a given number respectively. Define a class “StepNumber” that inherits the DigitExtraction class. The StepNumber class consists of a function “step” which aims at calculating the number of steps needed to reduce the number N to 0.

Given an integer **N**. The following tasks are performed:

* The number is noted.
* The leading digit from **N** is subtracted from **N** and the resulting value is stored back in N.
* This process is continued till N becomes 0. Finally, the number of steps is displayed.

For example, take **N = 13**. The numbers noted down in the process of reducing 13 to 0 will be:

13

13 – 1 = 12

12 – 1 = 11

11 – 1 = 10

10 – 1 = 9

9 – 9 = 0

Number of Steps: **5**

**SET -3**

Create a class “Account” that maintains the userid and account number of each customer. Create a class “**CheckingAccount”** with the functions showAccount, deposit and withdraw (double amount). If the balance amount after withdrawal is less than the minimum balance then throw a user defined error **InsufficientFundsException**. Use showAccount function to receive the userid and display the corresponding account number. If the userid doesnot exist raise the user defined error “NoUserId” which displays the message “ class name: No such User id along with the user-id.

**SET – 4**

Given an array A of N integers. Two functions NextGreater and NextSmaller are defined and the purpose of those functions are stated below.

**NextGreater(X):** This is the smallest number Z such that X< Z ≤ N and A[X] < A[Z]

**NextSmaller(X) :** This is the smallest number Z such that X < Z ≤ N and A[X] > A[Z]

Now, you need to find for each index i of this array NextSmaller(NextGreater(i)), where 1≤i≤N . If such a number does not exist, for a particular index i, raise user defined error “NoSuchNumber”. If such a number does exist, output A[NextSmaller(NextGreater(i))]

Sample Input

3

7

1

7

8

4

5

2

Sample Output

1 4 4 4 -1 2 -1 -1

**Explanation**

Next Greater     Next Smaller  
3 --> 7                 7 -->1  
7 --> 8                 8 -->4  
1 --> 7                 7 --> 4  
7 --> 8                 8 --> 4  
8 --> -1                -1 --> -1  
4 --> 5                 5 --> 2  
5 --> -1                -1 --> -1  
2 --> -1                -1 --> -1

**SET- 5**

Write a program with a class English which contains two methods: getAWord() and getASentence(). getAWord() should throw a user defined exception “IllegalWordexception” if the user entered string contains at least a non-English alphabet. getASentence should throw a user defined exception “IllegalSentenceException” , if the last character of the sentence is not an English alphabet or the length of the string exceeds 50. Create a main class with a function getInput() which accepts the value from the user and gives a function call to the above 2 functions. Throw appropriate error messages for the same.

**SET – 6**

Define a class “Fantabulous” consisting of member function “pair” to identify whether the given number of a fantabulous number. An array of length at least 2 having distinct integers is said to be fantabulous iff the second highest element lies **strictly to the left** of the highest value. For example, *[1, 2, 13, 10, 15]* is fantabulous as the second-highest value *13* lies to the left of highest value *15*.  
For every fantabulous array, we define a fantabulous pair **(a, b)** where **a** denotes the index of the second-highest value (1-indexed) and **b** denotes the index of the highest value (1-indexed). In the above array, the fantabulous pair is (3, 5). create a class called “Mancunian” consisting of fantsubarray function to identify all distinct fantabulous pairs. The mancunian class inherits the properties of Fantabulous class.